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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/089,210	03/25/2002	Shinichiro Tajiri	Furusawa 62	2580

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EXAMINER

CALEY, MICHAEL H

ART UNIT	PAPER NUMBER
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2871

DATE MAILED: 07/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/089,210

Applicant(s)

TAJIRI, SHINICHIRO

Examiner

Michael H. Caley

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☒ Claim(s) 1-22 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 March 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Objections

Claim 1 is objected to because of the following informalities:

Applicant uses alternative language in limiting the operation of the first, second, and third polarization converting elements rendering the claim unclear as to whether a voltage is optionally controlled. As stated, it is unclear whether the polarization is converted or allowed to remain the same by controlling a voltage in both cases as supported by the specification, or if the polarization is allowed to remain unchanged by controlling the voltage or changed by not controlling a voltage. The claim should be amended such that the presence of a voltage control is explicitly stated as either present or optional. The Examiner suggests separation of the recitation of the voltage controlling element from the alternative statements regarding the operation of the polarization converting elements. In order to perform examination using the broadest interpretation of the claims, it is interpreted that the existence of a voltage controlling element is an optional component, however, no basis for the operation of the device as such is given in the specification.

Claims 1-22 are objected to because of the following informalities:

Applicant makes various references having lack of antecedent basis.

Regarding claim 1, the second reference to polarization spectroscopic elements limits them to being narrow-band elements, however they were not introduced as having such a limitation in their title.

Claims 2-4 reference a wide-band polarization spectroscopic element not formerly introduced.

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Claims 5, 8, 11, and 14 reference a transparent substrate not formerly introduced.

Claims 7, 10, 12, 15, and 16 reference a rectangular prism not formerly introduced.

Claims 16-22 reference one or two emission sides not formerly introduced which render unclear how many emission sides are available to each of the embodiments claimed.

Additionally, claim 21 references a quarter wave plate and mirror not formerly introduced.

The preceding list is not exhaustive of all references containing lack of antecedent basis. Applicant is strongly encouraged to check over claims such that a proper antecedent exists for all references to objects which would not inherently and obviously exist, such as a single transmission or emission side of a color filter.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Hiroshima et al. (U.S. Patent No. 5,357,288 “Hiroshima”).

Regarding claim 1, Hiroshima discloses a polarized light color filter comprising:

- a first polarized light converting element;
- a first polarization spectroscopic element;
- a second polarized light converting element;

a second polarization spectroscopic element;
a third polarized light converting element
a third polarization spectroscopic element (Figure 6 element 10B, Figure 1 element 12);

wherein the elements are sequentially accumulated with the first polarized light converting element being provided on a transmission side (Figure 6);

wherein each of said first, second and third polarized light converting elements is designed for being capable of selectively emitting the incident light, which has been polarized to the P-polarized light or to the S-polarized light, either after converting to the other polarized light or as it is by controlling the voltage applied thereto (Figures 6);

wherein said first, second, and third polarization spectroscopic elements are composed of the first, second, and third narrow-band polarization spectroscopic elements designed for being capable of reflecting only components of the first, second, and third primary lights corresponding to the primary colors corresponding to the three primary colors while transmitting other components (Figure 6);

wherein said first, second, and third polarized light converting elements and said first, second, and third polarization spectroscopic elements are arranged at an angle to the optical path (Figure 1).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, and 6-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Faris (U.S. Patent No. 5,221,982) in view of Yajima (U.S. Patent No. 6,404,550).

Regarding claim 1, Faris discloses a polarized light color filter comprising:

- a first polarized light converting element;

- a first polarization spectroscopic element;

- a second polarized light converting element;

- a second polarization spectroscopic element;

- a third polarized light converting element;

- a third polarization spectroscopic element (Figure 5 elements 82-88);

wherein the elements are sequentially accumulated with the first polarized light converting element being provided on a transmission side (Figure 5);

wherein each of said first, second and third polarized light converting elements is designed for being capable of selectively emitting the incident light, which has been polarized to the P-polarized light or to the S-polarized light, either after converting to the other polarized light or as it is by controlling the voltage applied thereto (Figures 6a-6h);

wherein said first, second, and third polarization spectroscopic elements are composed of the first, second, and third narrow-band polarization spectroscopic elements designed for being capable of reflecting only components of the first, second, and third

primary lights corresponding to the primary colors corresponding to the three primary colors while transmitting other components (Column 7 lines 22-48);

wherein said first, second, and third polarized light converting elements and said first, second, and third polarization spectroscopic elements are arranged at an angle to the optical path (Figure 5).

Faris fails to disclose the first, second, and third narrow-band polarization spectroscopic element as designed for being capable of reflecting only the S-polarized light components of the primary colors. Yajima, however, discloses a spectroscopic element as designed for being capable of reflecting only the S-polarized light components of the primary colors in a polarization conversion device for a projection display apparatus (Figures 5A and 5B).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a spectroscopic element such as disclosed by Yajima as a means of reflecting only the S-polarized light components of the primary colors. Faris discloses an embodiment of his device utilizing separation between circularly polarized lights, but also teaches embodiments in which linearly polarized lights are used (Figures 6a-6h). One would have been motivated to use a conversion device to separate and convert between S-polarized and P-polarized lights and in turn use a spectroscopic element reflecting only the S-polarized light as an engineering expediency. Such a color filter would require alternative types of materials and construction method as taught by Yajima, which may be favorable for mass production of such a product due to lower cost and complexity.

Regarding claim 2, Yajima discloses the first polarization spectroscopic element as designed for being capable of reflecting the S-polarized light component of the incident light over the whole range of the visible light side of the first polarized light converting element (Figure 5).

Regarding claims 6, 9, 12, and 15, Faris discloses the first, second, and third polarized light converting elements and the first, second and third narrow-band polarization spectroscopic elements as accumulated and interposed between the inclines of the two pieces of rectangular prisms, which forms a rectangular parallelepiped when joined by their respective inclines. Faris, however, teaches combining such polarized light converting elements in such a shape for a single panel color projection LCD (Figure 5).

Regarding claims 7, 10, 13, and 16, Faris discloses the elements as accumulated on the incline of the prism (Figure 9B).

Regarding claims 8, 11, and 14, Faris discloses the elements as accumulated on the transparent substrate (Figure 9 element 132).

Regarding claims 17 and 19, Faris discloses the reflection optical modulating element as provided on the emission side of the polarized light color filter; the projection lens on the non-emission side of the polarized light color filter; the three primary lights to be emitted to the reflection optical modulating element from the polarized light color filter as controlled on the time-division basis by controlling the voltages applied to the first, second, and third polarized light converting elements (Figure 12).

Regarding claims 18 and 20, Faris discloses the sequential transmission optical modulating element and the projection lens as provided on the emission side of the polarized light color filter and the voltages applied to the first, second, third, and fourth polarized light converting elements as controlled so that the three primary lights to be emitted to the transmission optical modulating element from the polarized light color filter can be controlled on the time-division basis (Figure 13).

Regarding claim 21, Faris discloses the reflection optical modulating element as provided on one of the emission sides of the polarized light color filter, and the quarter wave plate and the total reflection mirror are sequentially provided on the other transmission side (Figure 13 element 155a, Figure 4D element 59).

Regarding claim 22, Faris discloses the reflection optical modulating element as provided on one of the emission sides of the polarized light color filter, and the second reflection optical modulating element as having an identical structure with the first reflection optical modulating element and provided on the other emission side of the polarized light color filter (Figures 12-14 elements 155 and 156).

Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsujikawa et al. (U.S. Patent No. 6,130,728 "Tsujikawa").

Regarding claim 1, Tsujikawa discloses:

- a first polarized light converting element;
- a first polarization spectroscopic element;
- a second polarized light converting element;

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a second polarization spectroscopic element;

a third polarized light converting element;

a third polarization spectroscopic element (Figure 2 elements 11B-12G, 103, 104, 105, 107, and 108);

wherein each of said first, second and third polarized light converting elements is designed for being capable of selectively emitting the incident light, which has been polarized to the P-polarized light or to the S-polarized light, either after converting to the other polarized light or as it is by controlling the voltage applied thereto (Figure 2);

wherein said first, second, and third polarization spectroscopic elements are composed of the first, second, and third narrow-band polarization spectroscopic elements designed for being capable of reflecting only the S-polarized light components of the first, second, and third primary lights corresponding to the primary colors corresponding to the three primary colors while transmitting other components (Figure 2 elements 11B-12G);

wherein said first, second, and third polarized light converting elements and said first, second, and third polarization spectroscopic elements are arranged at an angle to the optical path (Figure 2 elements 11B-12G).

Tsujikawa discloses all of the proposed limitations except for the elements as sequentially accumulated. Tsujikawa discloses an embodiment in which the polarized light converting elements and the polarization spectroscopic elements are directly coupled to one another, in which case it would be most straightforward to sequentially accumulate such elements in

manufacturing (Figure 2). Such limitations directed to the process of manufacturing, however, do not further limit the claim as patentable over the prior art reference as long as the embodiment disclosed by the reference would have been able to be manufactured using the same process, as such limitations are better suited for a claim for the method of production.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have sequentially accumulated the optical elements as proposed. Such a design would have been most straightforward for the embodiment disclosed by Tsujikawa since the elements are directly coupled to one another within the device. Such a design would have been motivated by a desire to create the device with the highest coupling efficiency possible between the elements.

Regarding claim 2, Tsujikawa discloses the first polarization spectroscopic element as designed for being capable of reflecting the S-polarized light component of the incident light over the whole range of the visible light side of the first polarized light converting element (Figure 2 element 11B).

Regarding claim 3, Tsujikawa discloses the fourth polarized light converting element as designed for being capable of selectively outputting the incident light, which has been converted to the P-polarized light or the S-polarized light, after converting to the other polarized light or as it is by controlling the voltage applied thereto, is provided on the emission side of the third polarization spectroscopic element (Figure 2 elements 107 and 108).

Regarding claim 4, Tsujikawa discloses the second polarization spectroscopic element as capable of reflecting the S-component of the incident light while transmitting the P-polarized

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component over the whole range of the visible lights, provided on the emission side of the third polarized light converting element (Figure 2 element 12B).

Regarding claim 5, Tsujikawa discloses the elements as accumulated on a transparent substrate (Figure 2 elements 104 and 107).

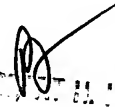
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael H. Caley whose telephone number is (703) 305-7913. The examiner can normally be reached on M-F 8:30 a.m. - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (703) 305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

mhc

mhc
June 16, 2003


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